

9. Ecological Restoration in Pennsylvania Avenue and Fountain Avenue inactive landfills

ALAMARIE Kaled, FORGIONE Helen, McLAUGHLIN John

New York City Department of Environmental Protection

Abstract:

Throughout the United States there are many inactive landfill sites that no longer take municipal waste, but never went through an approved closure process. Most Inactive landfills in New York City are located in historical wetland areas. New York City Department of Environmental Protection (NYCDEP) simultaneously remediated two landfills adjacent to each other - Pennsylvania Avenue, 110 Acre Site; and Fountain Avenue landfill, a 297 Acre site- located in the South East of the Borough of Brooklyn. Both sites occupy critical estuarine ecological functions and habitat value. In addition to controlling the leachate and to prevent the accumulation and migration of dangerous gases by placing impervious capping system, Topsoil with stringent geotechnical specification requirement is placed to support vegetation. A total of 195,000 and 720,000 cubic yard of topsoil delivered to Pennsylvania Avenue and Fountain Avenue landfills respectively to support ecological restoration of both landfills.

With the right topsoil mixture, trees, shrubs and grasses can be planted with out affecting the primary protective layer that serves as the landfill cap. If the cap gets damage water can penetrate causing moisture reduction. The landfills were formerly owned by the City of New York and operated as a municipal solid waste landfill by the New York City Department of Sanitation. Both landfills are currently listed as a class 2A site on the New York State registry of inactive Hazardous Waste Sites. NYCDEP fulfilled the construction and planting phase, including importing sandy loam topsoil. Native grasses, 25 species of trees, 30 species of shrubs and 20 species of wild flowers that are native to coastal areas are planted on both sites. Plant community structure were carefully selected based on climate, soil, wind, salt & salty spray, and fire; they represent a full array of biological diversity of the area. In addition to placing soil throughout the landfills, additional soils were placed creating berms. The berm averages three feet in depth to support tree growth. Prior to delivering the soil every barge of soil placed- 2500 Cubic Yard- is chemically tested and placed in the landfills. Soil Berms are designed within the landfill to support plant growth; four different kinds of terrestrial Plant communities were selected for the restoration.

To assess success or failure of the restoration, and the long- term viability of ecological integrity, NYCDEP designed and implemented monitoring protocols for vegetation placed in the landfill. Success or failure is defined as the successful establishment of the plants placed in the landfill. These include plant mortality rate, and percentage of grass coverage in the planted area. Placed soil that is tested is monitored for understanding the biogeochemical cycles on both sites.

Key Words: Biogeochemical, Ecological, Inactive, landfill, Restoration, Topsoil

Topic: C. Urban soils and ecosystem services

Sub-topic: C6. Remediation & cleanup standards of contaminated soils

Presentation type: Oral

Information of corresponding author

Full name: Kaled Alamarie

Organization: NYC Department of Environmental Protection

Mailing address: 59-17 Junction Blvd, 11th Floor, Corona, NY 11373

Tel.: (718) 595-3453

E-mail: Kalamarie@dep.nyc.gov